Name: ____________________ Date: ____________

Polynomial Factoring solution (version 667)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-48}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{3}\, i}{2}$$

$$x = -1 \pm 2\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 2i$ and $-8 - 3i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 2i) \cdot (-8 - 3i)$$

$$72 + 27i - 16i - 6i^2$$

$$72 + 27i - 16i + 6$$

$$72 + 6 + 27i - 16i$$

$$78 + 11i$$

Polynomial Factoring solution (version 667)

3. **Write function** $f(x) = x^3 - 10x^2 + 19x + 30$ **in factored form. I'll give you a hint: one factor is** $(x+1)$**.**

Solution

$$\begin{array}{r|rrrr} & 1 & -10 & 19 & 30 \\ -1 & & -1 & 11 & -30 \\ \hline & 1 & -11 & 30 & 0 \end{array}$$

$$f(x) = (x+1)(x^2 - 11x + 30)$$

$$f(x) = (x+1)(x-5)(x-6)$$

4. **Polynomial** p **is defined below in factored form.**

$$p(x) = -(x+7)^2 \cdot (x+4)^2 \cdot (x-1) \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$**.**